VOL. XV. NO. 2.— BOTANICAL GAZETTE.— FEB., 1890.

Undescribed plants from Guatemala. VII.

JOHN DONNELL SMITH.

(WITH PLATES III and IV.)

Oxalis dimidiata (§ *Euoxys* Progel in Fl. Brasil.)—Smooth except insertion of petioles and of leaflets: rhizome tuberose, woody, dentate with thick ovate reddish scales: leaflets ternate, subcoriaceous, purple and linear-punctate beneath, lobes widely diverging and oblong-rhomboidal, the exterior one of lateral leaflets reduced to a cuneate wing: scape little exceeding leaves, 4-6 inches long, umbellately 4-flowered: sepals lanceolate, apex biglandular: corolla more than twice longer (5-6 lines), purple; longer filaments ciliolate, edentulate: styles barbate: capsule lanceolate-oblong, a little exceeding calyx, cells 3-4-seeded.—Low grounds near Coban, Depart. Alta Verapaz, alt. 4,300 feet, April 1889, J. D. S. (Ex Pl. Guat., qu. edid. J. D. S., 1682.)

Hanburia parviflora. BOTAN. GAZETTE, xiii, 299.—Leaves undivided and oblong-lanceolate, or 2-3-partite, margin entire or coarsely dentate: monoicous flowers from same or distinct axils, peduncle of the female twice exceeding raceme of the male: fruit obliquely ovate-lanceolate, sparsely echinate and tuberculate.—The characters, completing description, are drawn from my collections in clearings at Pansamalá, April, 1889, the stems, many yards long, forming thickets. (Ex Pl. cit. 1509.)

Styrax Guatemalensis.—Tree 30–40 feet high; pubescence of branchlets, petioles and inflorescence stellular, flavescent sprinkled with red: leaves glabrous, membranaceous, oval or obovate, acuminate, base acute, entire, 3–4 inches long, half as broad: flowers nodding, 5–8 in a terminal short loose raceme, also single or geminate from upper axils, 8 lines long: calyx sub-equaling pedicel and petioles, truncate, teeth nearly obsolete: petals twice exceeding calyx, canescent, one-third-adnate, imbricating, oblong, obtuse: shortly monadelphous stamens inserted below throat: ovary one-third-immersed, ovules about 24.—Sasis, Depart. Alta Verapaz, alt. 5,000 feet, April, 1889, H. Helmrick (Ex Pl. cit. 1690.)—*S. grandifolia* Ait. differs by discolorate leaves, toothed calyx, long raceme; *S. glabrescens* Benth., *ex descript.* also

a related species, by ovate leaves, half-larger flowers, obovate petals, etc.

Solanum oliværforme. BOTAN. GAZETTE, xiv, 28.—Matured fruit strongly compressed, sides unequally convex, margin winged: seeds orbicular, granulate.—Barrancas of Rubelcruz, Depart. Alta Verapaz, alt. 2,500 feet, April, 1889, J. D. S. (Ex Pl. cit. 1785.)

Campanea picturata.—Repent at base, rufo-villose: leaves scabrid above, pubescent beneath, crenate, inæquilateral; the larger of the pair oblong-lanceolate, 5–7 in. long, exceeding peduncle; the other ovate-lanceolate: pedicels 3–4-fasciculate, chiefly simple, 1–3 inches long; bracteoles minute: calyx segments smooth within, lanceolate, 9 lines long: corolla greenish-white and hairy without, pure-white within; tube campanulate, twice exceeding calyx; purple serial markings of bilabiate limb punctiform near margin, larger or oblong elsewhere, erect upper lip half as long as tube and bifid, spreading lower lip shorter and trifid, lobes semi-orbicular and entire: filaments curving; purple-spotted anthers cohering in 8-lobed circle: ovary nearly free, glands connate in a ring. —A pseudo-parasitic shrub, 3-4 feet high, collected by Baron Von Türckheim and myself at an altitude of 6,000 feet in the Alta Verapaz forests, Apr., 1889 (Ex Pl. cit. 1501).—In size and coloring of flowers scarcely inferior to *C. grandiflora* Dcne, and with its corolla, stamens and glands. The indument, foliage, inflorescence and calyx are nearly those of *C. Œrstedii* Klotzsch.

EXPLANATION OF PLATE III.—Fig. 1. upper part of plant. Fig. 2, flower laid open. Fig. 3, anthers. Fig. 4, ovary. Fig. 5, portion of upper surface of leaf. Fig 6, hair of indument. (Figs. 1 and 2 are natural size; the others are variously magnified.)

Carpinus Americanus Michx., var. tropicalis.—Branchlets, petioles, leaf-nervatures, rhachis and nuts pubescent: fertile spikes 2½ inches long, nearly thrice exceeding peduncles, about 20-flowered: bractlets small, oblong, obtuse, mucronate, minutely hastate on one or both sides, otherwise nearly entire.—Chicoyonits, Depart. Alta Verapaz, alt. 4,300 feet, April 1889, J. D. S. (Ex. Pl. cit. 1667). To the variety is referred also *no. 1446 Lehmann Pl. Guatemal. Costaric. Columbianæ*, collected in same department, May, 1882. *Nos. 2606, 2607 Bernouilli & Carlo Fl. Guatemal.* are cited by Mr. Hemsley as *C. Americanus*. The genus is otherwise unrecorded from any locality south of Florida.

"**Tradescantia subscaposa,** sp. nova. Glabra: foliis omnibus subradicalibus, subsessilibus latissime oblongis, subito acutatis: paniculâ 10-25 cm. longâ, longe pedunculatâ, oblongâ, compositâ, floribus plurimis condensatis: petalis purpureo-roseis, venosis: staminibus perfectis 6, filamentis glabris; antheris ellipsoideis, longitudinaliter dehiscentibus, in connectivo subquadrato lateraliter sessilibus: ovario apice glanduloso-piloso. — Species T. Warszewicziannæ, Kunth et Bouché (C. B. Clarke in DC. Monograph. iii. 302), proxima. Pseudoscaposa; bracteæ inferiores 1-3 cm. longæ, non cum foliis consimiles. Quam a sepalis herbaceis, tam a petalis coloratis antherisque, Tradescantiæ potius quam Spironemati affinior. Cl. Hasskarl autem T. Warszewiczianam quasi Spironematis speciem notaverat." C.B.Clarke *in litt.* 23 Dec., 1889.—Rock-crevices, Santa Rosa, Depart. Baja Verapaz, alt. 5,000 feet, July, 1887, von Türckheim (Ex Pl. cit. 1213). Distributed by me as *Spironema sp.*

Asplenium Vera-pax. BOTAN. GAZETTE, xiii. 77.—This fern, supposed to have been undescribed, is now referred to *A. Riedelianum* Bong., a species reported only from some of the southern provinces of Brazil.

Nephrodium duale (*Lastrea*). — Rhizome epiphytal, sarmentose, very stout, densely clothed with long scales: stipes scattered, smooth, 10-18 inches long: twice to thrice longer fronds and their divisions deltoid-lanceolate, coriaceous, glabrate, decompound, dimorphous; lower secondary pinnules of sterile frond 2 inches long, cut nearly to rhachis into elliptic decurrent inæquilateral lobed segments 8 lines long; fertile frond and its divisions a third smaller, the distinct contracted oblong segments crenate-lobed with concave upper surface: sori confluent from the first, filling the whole surface of frond throughout; indusia large, imbricating, persistent, sinus shallow. — Pansamalá forest, alt. 4000 feet, Jan., 1889, Türckheim (Ex Pl. cit. 1408).—An anomalous species, and with nearly the indusium of *N. fragrans* Rich.

EXPLANATION OF PLATE IV.—Fig. 1, Fertile pinna, $\frac{2}{3}$ nat. size. Fig. 2, upper surface of a fertile secondary pinnule, nat. size. Fig. 3, lower surface of a pair of the above. Fig. 4, sori magnified. Fig. 5, sterile pinna, $\frac{1}{2}$ nat. size. Fig. 6 pair of sterile secondary pinnules, $\frac{2}{3}$ nat. size. Fig. 7, Rhizome.

Baltimore, Md.

A Revision of North American Cornaceæ. I.

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The term "North American" implies the customary limitation north of Mexico, an unnatural one, but necessary in the present state of our information.

The three genera of this order represented in North America are so different from each other that they have often been separated into as many orders. Our purpose, however, is not to discuss their ordinal relationships, but merely to present their species. For this reason, we give no generic descriptions, but accept the genera as ordinarily understood. We are greatly indebted to the following persons, who promptly put at our disposal the collections which they own or have in charge: Dr. Sereno Watson, Dr. George Vasey, Professor E. L. Greene, Professor John Macoun, Mr. John Donnell Smith, and Mr. I. C. Martindale.

Under each species the general range is first given, followed by a list of collectors whose material we have examined. This fact should be clearly understood, as an exhaustive list of stations and collectors is not intended. It was thought better to include only those specimens that had passed under our observation, and so avoid all possible confusion.

CORNUS Tourn.—The involucrate and non-involucrate flower-clusters furnish the first and most evident grouping of the species. The non-involucrate species are the most perplexing, and in several instances evidently intergrade. Among them the character of the pubescence is very important, being straight and appressed or silky. In the former case the hairs are attached at or near the middle, are very stiff and more or less tuberculate-roughened, and are characteristic of the genus. Such hairs are almost universally found upon the upper leaf-surfaces of *Cornus*, but upon the under surfaces they may be replaced by a loose and silky pubescence, which is attached near one end, and is not rigid or tuberculate. As is to be expected, both forms of pubescence may occasionally be found upon a lower leaf-surface, but these characters are generally quite constant. The stones, in most cases, furnish excellent specific characters, though in some species they are so exceedingly variable (notably so in *C. stolonifera*) that they can only be used in

a negative way. The specific relationships are in some cases quite intricate, so that they can not be expsessed in a lineal arrangement. Whenever these closely related species overlap in range, many puzzling intermediate forms are found, but if they be accepted as such they are easily understood. At a distance from the regions of overlapping these species are as distinct as any. A notable illustration of intermingling species is to be found in the Lake Superior region, where *C. stolonifera*, *C. asperifolia*, and *C. Baileyi* exhibit many intermediate forms. Another such region is to be found along the Pacific coast, especially from Washington to Northern California, where *C. stolonifera* and *C. pubescens* intergrade. *C. glabrata* of the Pacific coast finds its Atlantic congener in *C. candidissima*, but they are so far dissociated that there is no longer any confusion. *C. stolonifera* is the species of widest range and characters, and seems to have points of contact with almost all the other non-involucrate forms.

*Flowers greenish (except in no. 2), in a close cyme or head, surrounded by a conspicuous involucre of 4 to 6 white petal-like bracts: fruit bright red.

+ Low and herbaceous, from a slender creeping subterranean rootstock.

1. **C. Canadensis** Linn. Spec. 117. Stems simple, 7.5 to 20 cm. high: leaves scarcely petioled, mostly in an apparent whorl of 4 or 6 near the summit, oval, ovate, or even obovate, pointed at both ends, somewhat appressed-pubescent on both sides, 2.5–7.5 cm. long, .8 to 3.8 cm. wide; near the middle of the stem a pair of smaller leaves, and scale-like bracts below: peduncle 1.2 to 3.8 cm. long: involucral bracts 4, white or cream-color, ovate (often broadly so), 6 to 16 mm. long: fruit globular; stone smooth, not flattened, a little higher than broad (2.5 mm. high, 1.5 mm. broad).

Hab. Across the continent as far north as forests, and extending southward in damp cool woods to New Jersey, N. Indiana and Minnesota, and in the western mountains to Colorado and N. California.

Specimens examined: Alaska (*Kellogg* 30, 135), head of the Yukon (*Lt. Schwatka*), Unalaska (*Albatross Exped., Harrington*), Sitka (*Bongard, Bischoff*); British Columbia (*Tolmie, Wallace, Macoun*); Saskatchewan (*Bourgeau*); Labrador (*Turner, Mann, Stores, Anspach*); New Brunswick (*J. D. Smith, Osborn*); Maine (*Rounds, Redfield*); New Hampshire (*Meehan*); Vermont (*Pringle*); Massachusetts (*Oakes, Morong*); New York (*Clinton*); Pennsylvania (*Traill Green, Ndl, Tenbrock*); Ontario (*Macoun* 525. *Billings*); Michigan (*Clarke*); Wisconsin (*Douglass*); Colorado (*Parry* 437); Montana (*Watson*); Idaho (*Coulter*); Washington (*Wilkes' Exped.* 589, *Lyall*,

Suksdorf, G. R. Vasey 430); Oregon (*Durand, Hall* 220); California (*Bolander* 4776).

2. **C. Suecica** Linn. Spec. 118. Stems sometimes branching above, 5 to 25 cm. high: leaves sessile, all opposite, becoming smaller downwards, ovate or oval, acute, nerves all arising at or near the base, appressed-pubescent on both sides, uppermost leaves 1.2 to 3.8 cm. long, 1.2 to 1.8 cm. wide: peduncle 1.2 to 3 cm. long: involucral bracts 4, white or creamcolor, ovate, 6 to 12 mm. long: flowers dark purple: fruit globular; stone flattened, mostly with a shallow furrow on each face, acute, as broad as high (3 mm.).

Hab. From Newfoundland and Labrador to Greenland and Alaska.

Specimens examined: Labrador (*Stores*); Alaska (*Harrington, Dall*); Behring Straits (*Wright*); Kowak river (*McLenegan*); Norton Sound (*Bannister*); St. Paul, Kodiak Is. (*Beard* in 1889).

3. **C. Unalaschkensis** Ledebour, Fl. Ross. 2. 378. "Leaves subequal, sessile, oblong, 5 to 7-nerved almost from the base; upper ones verticillate: umbel peduncled, involucrate: calyx-teeth ovate-lanceolate, acute."

Hab. Island of Unalaska. Collected by Eschscholtz and Chamisso. The species is included in Rothrock's Fl. Alask., not as having been collected by him, but as having been reported to occur.

We have seen no specimen of this species, and simply translate Ledebour's description. In his remarks upon the species he says: "It differs from *C. Suecica* in its upper leaves being verticillate; from *C. Canadensis* in its leaves being 5 to 7-nerved and all nearly equal (the lower ones not much smaller); from both in its narrower leaves and in its calyx-teeth being longer, narrower and more acute." The flower and involucral leaves were unknown to the author.

++ Shrubs or trees.

4. **C. florida** Linn. Spec. 117. From a low shrub (towards its northern limits) to a tree 9 to 12 meters high (at the south): petioles 5 to 18 mm. long: leaves ovate or elliptical, occasionally somewhat obovate, acuminate, mostly acute at base, minutely appressed-pubescent above, whitish beneath and with sparse mostly appressed-pubescence, 6 to 14 cm. long, 3.5 to 9 cm wide: involucral bracts 4, white often tinged with red, obcordate or with callous notch at apex, 1.2 to 5 cm. long, 1.2 to 4 cm. wide; head of flowers 6 to 14 mm. in diameter: fruit ovoid, crowned with a narrow persistent calyx; stone ovoid, smooth, 6 to 8 mm. high, 4 to 5 mm. broad.

Hab. From Southern New England, Ontario, and Minnesota, to Florida and Texas.

Specimens examined: Ontario (*Macoun* 101); Michigan (*Clarke*); Indiana (*Coulter, Thomson, Evans*); Ohio (*Sullivant*); Pennsylvania (*Porter, Martindale, Miss Davis*); Maryland (*J. D. Smith*); District of Columbia (*Parry, G. R. Vasey*); Virginia (*A. H. Curtiss*); West Virginia (*J. D. Smith*); South Carolina (*M. A. Curtiss*); Georgia (*G. R. Vasey*); Mississippi (*Whinery*); Texas (*Hall* 266); Indian Territory (*Palmer* 153); Arkansas (*Bigelow*).

5. **C. Nuttallii** Audubon, Birds, t. 467. Resembling the last but becoming taller (15 to 24 meters high): petioles 6 to 25 mm. long; leaves mostly obovate, generally woolly pubescent beneath and with intermixed appressed hairs: involucral bracts 4 to 6, narrowly oblong to obovate or even round, obtuse, abruptly acute, or acuminate, larger (3.5 to 7.5 cm. long, 1.8 to 6 cm. wide); head of flowers larger, 1.4 to 2 cm. in diameter: fruit crowded among abortive ovaries, crowned with the broad persistent calyx, larger; stone 8 to 10 mm. high, 7 to 8 mm. broad.

Hab. From British Columbia and Vancouver Island, through the Pacific States to Southern California.

Specimens examined: British Columbia, Frazer river (*Lyall, Macoun* 528); Buzzard Inlet (*Macoun*); Vancouver's Island (*Wood*); Washington (*Wilkes's Exped., Suksdorf, Brown, G. R. Vasey* 141); Oregon (*Tolmie, Hall* 219, *Howell* 176, *W. S. Carpenter* 121); California (*Hartweg* 1763, *Bolander* 3966, *Brewer* 1444, 2675, *Parry & Lemmon* 150, *J. G. Lemmon, Greene, Mrs. Ames, Mrs. Austin, G. R. Vasey*).

* * Flowers yellowish, in sessile umbels, appearing before the leaves, involucrate with 4 small deciduous bracts: fruit dark blue.

6. **C. sessilis** Torr. in Durand Pl. Pratten. 89. Shrub 3 to 4.5 meters high with greenish bark: leaves short-petioled, approximate, ovate, short acuminate, nearly smooth above, pale beneath and with appressed and silky pubescence, 5 to 9 cm. long, 2.5 to 6 cm. wide: umbels terminal but becoming lateral by the development of the shoot; involucral bracts 6 to 8 mm. long, about as long as the slender silky pedicels: fruit oblong, 12 to 15 mm. long, 6 to 10 mm. broad; stone oblong, somewhat pointed and longitudinally ridged, 9 to 11 mm. long, 4 to 5 mm. broad.

Hab. Wet ravines and foothills, Northern California.

Specimens examined: California, with no station (*Pratten, Bigelow, Bolander, Mann, Parry* 776, *G. R. Vasey*); Upper Sacramento (*Hooker & Gray, Greene*), American river (*State Survey* 204), McCloud's River (*Lemmon*), Placer county (*G. R. Vasey*), Butler county (no collector indicated), Humboldt county (*Rattan*).

In previous descriptions mature fruit has not been described. Specimens collected by Drs. Hooker and Gray, on the Upper Sacramento, show mature fruit and much larger than was expected. In the dried state the color is hard to determine, as the fruit then has the color of dried prunes. Our conclusion is that it is a dark blue, but it is barely possible that it may be a dark red.

* * * Flowers white or cream-colored, cymose, not involucrate: fruit white, lead-color, or blue.

+ Leaves opposite.

++ Lower leaf surface with more or less silky or woolly pubescence (except sometimes nos. 11 and 13).

(1) Stone pointed at base, more or less prominently ridged, flattened slightly or not at all, 5 to 7 mm. high, 4 to 7 mm. broad.

7. **C. Torreyi** Watson, Proc. Am. Acad. 11. 145. Shrubby, with slightly pubescent branches: branchlets and inflorescence pubescent: petioles slender, 12 to 18 mm. long; obovate to oblanceolate or oblong, abruptly acute or shortly acuminate, appressed-pubescent above, paler and somewhat pubescent beneath with loose silky hairs, 3.5 to 6 cm. long, 1.8 to 3 cm. wide: cyme loose and spreading: calyx-teeth very minute: fruit white; stone obovoid, somwhat compressed, oblique, acute at base (as if beaked), ridged on the edges, higher than broad (5 to 7 mm. high, 4 mm. broad).

Hab. Yosemite valley and mountains, California.

Specimens examined: *Dr. Torrey's* original collection of 1865, no other collection ever having been made. The leaves of this species are much like those of *C. pubescens*, but the stone is unlike any other with which we are acquainted. It is to be hoped that it may be rediscovered by some of our zealous Californian botanists.

8. **C. sericea** Linn. Mant. 2. 199. Shrub 1 to 3.5 meters high, with branches mostly purplish: branchlets and inflorescence silky-downy: petioles 1.2 to 3.7 cm. long: leaves very variable, from lanceolate and narrowly ovate to broadly ovate and elliptical, mostly long acuminate, rounded or acute at base, nearly glabrous above, whitish and silky-(often rusty-) pubescent beneath (rarely glabrate), 2.5 to 12.5 cm. long, 2.5 to 8.5 cm. wide: flowers in broad rather compact cymes: calyx-teeth conspicuous (the largest of the genus): style abruptly and conspicuously swollen at tip: fruit pale blue; stone oblique and irregular, more or less pointed at base, longitudinally and irregularly sharp ridged, mostly

broader than high (5 to 6 mm. high, 4 to 7 mm. broad).—*C. lanuginosa* Michx. *C. obliqua* Raf.

Hab. Wet ground, from New Brunswick to Florida and westward to Dakota and Texas.

Specimens examined: Vermont (*Pringle*); Connecticut (*Eaton*); New York (*Gray, L. F. Ward*); Pennsylvania (*Porter*, very broad-leaved forms, *T. P. James, Martindale, Coulter*); New Jersey (*Martindale*); Maryland (*J. D. Smith*); District of Columbia (*Chickering, Ward, Seaman*); Virginia (*Curtiss*); North Carolina (no collector given); South Carolina (*Mrs. Thompson*); Georgia (*Rugel*); Ontario (*Burgess, Macoun*); Michigan (*Clarke*); Wisconsin (*Douglas, Mrs. Luce*); Illinois (*Bryce, Brendel, Wolf*); Iowa (*Burgess*); N. Texas (*Bigelow*).

Certain forms of this variable but very distinct species seem to have been mistaken by collectors for *C. stolonifera*; but even when the pubescence character is lacking, the prominent calyx teeth, the conspicuously swollen style-tip, and the large oblique irregularly and prominently ridged stone will serve to distinguish it with certainty.

(2). Stone globular or nearly so, mostly not at all ridged, 3 to 5 mm. in diamater.

9. **C. circinata** L'Her. Corn. 7. Shrub 1 to 3 meters high, with smooth greenish branches: branchlets and inflorescence appressed-pubescent: petioles about 12 mm. long; leaves round-oval, abruptly short-acuminate, minutely appressed-pubescent above, whitish and woolly beneath, 7.5 to 14 cm. long, 5 to 12 cm. wide: flowers in rather small compact cymes: calyx-teeth small: fruit light blue; stone spherical, not furrowed, small (3 mm. in diameter).—*C. rugosa* Lam. *C. tomentulosa* Michx.

Hab. From Nova Scotia to the mountains of Virginia, westward through the region of the Great Lakes to Iowa and the Winnipeg Valley.

Specimens examined: Maine (*Young*); Vermont (*Pringle*); Massachusetts (*Sears*); New York (*Gray, Mertz, Martindale*); Pennsylvania (*Porter, Martindale*); District of Columbia (*Conant*); Ontario (*Macoun* 531); Michigan (*Pitcher, Clarke*); N. Illinois (*Babcock*); Wisconsin (*Douglas*); Winnipeg Valley (*Bourgeau*).

10. **C. asperifolia** Michx. Fl. 1.93. Erect shrub 1 to 4.5 meters high, with reddish-brown mostly pubescent branches: branchlets and inflorescence rough pubescent: petioles 3 to 18 mm. long; leaves from narrowly ovate to round-ovate and oblong, from short to conspicuously acuminate, acute or obtuse at base, rough pubescent above, whitish and roughish woolly beneath, 3.5 to 12.5 cm. long, 1.8 to 7.5 cm. wide: flowers in loose mostly broad often paniculate cymes: calyx-teeth small:

fruit white on red stalks; stone not compressed, occasionally somewhat oblique, with a slightly furrowed edge, but little broader than high (about 4 mm. in diameter).

Var. **Drummondii.** Leaves harsher and usually more crowded: stone smaller, broader than high (hardly 3 mm. high).—*C. Drummondii* C. A. Meyer.

Hab. From Ontario to Iowa, southward to South Carolina, Florida and Texas.

Specimens examined: Ontario, Point Pelee (*Macoun*); Ohio (*Riddell*); Indiana, New Albany (*Clapp*), Crawfordsville (*Thomson, Evans*); Illinois, Oquawka (*Patterson*), Canton (*Wolf*), Athens (*Hall*), Peoria (*Brendel*); Missouri, St. Louis, (*Engelmann, Eggert*); Kansas, Ellis (*L. Watson*); Arkansas, Ft. Smith (*Bigelow*); Indian Territory (*Palmer* 154); Texas (*Berlandier* 340, 352, 2545, *Lindheimer* 158, 318), Houston (*Hall* 264), Dallas (*Reverchon* 379, 1053), Austin (*Rugel*), Harrisburg (*Joor* 128); Louisiana (*Nuttall, Hale*); Tennessee, Memphis (*Fendler*); South Carolina, "Santee Canal" (*Ravenel*); Florida (*Chapman*).

Although this species may usually be recognized by the roughness of the upper leaf-surface, the most certain characters are to be found in the stone, which separates it from any species with which it is likely to be confused. The stone approaches that of *C. candidissima*, but it is not so globular, and the character of the leaf pubescence would not permit these two species to be confounded. It is hardly safe to separate the var. *Drummondii* from the species without mature fruit, although nearly all the forms we have examined from the southwest (from St. Louis southward) seem to be the variety.

11. **C. Greenei.** Apparently with the habit of *C. pubescens*, with smooth more grayish branches: branchlets and infloresence appressed-pubescent: petioles 6 to 12 mm. long; leaves from ovate or obovate to roundish oblong, abruptly acute or somewhat acuminate, acutish or rounded at base, appressed-pubescent to glabrate above, but little paler beneath and with an intermingling of woolly and straight rigid appressed hairs, 2.5 to 6 cm. long, 1.8 to 3.5 cm. wide: flowers large, in loose paniculate cymes: calyx-teeth triangular: styles with swollen green tips: fruit dark blue; stone globular, not furrowed, apt to be slightly ridged, 4 to 5 mm. in diameter.

Hab. California, from the University collection, with no locality noted.

This apparently very distinct species is most nearly related to *C. pubescens*, but its pubescence, large flowers in paniculate cymes, remarkable styles, and gobular stone, furnish as distinct a set of specific charac-

ters as is to be found among species of *Cornus*. The species is dedicated to Professor E. L. Greene, who has kindly furnished the material.

(3) Stone flattened, with furrowed edges, and broader than high, 3 to 4 mm. high, 4 to 6 mm. broad.

12. **C. pubescens** Nutt. Sylva, 3.54. Shrub 1.8 to 4.5 meters high, with smooth purplish branches: branchlets and inflorescence more or less hirsute: petioles 6 to 25 mm. long; leaves from narrowly to broadly ovate or oval, acute or somewhat acuminate (rarely obtuse), mostly acute at base, appressed-pubescent or glabrate above, whitish and silky pubescent beneath, 2.5 to 12 cm. long, 1.2 to 7.5 cm. wide: flowers in more or less compact cymes: calyx-teeth minute: fruit white; stone somewhat compressed, mostly oblique, with a more or less prominently furrowed edge, about 4 mm. high and 5 mm. broad, the sides apt to have more or less prominent ridges. (Occasionally the stones become higher than broad from the base being drawn out or beaked, thus approaching *C. Torreyi*.)

Var. **Californica.** Leaves more apt to be rounded at base: stone smaller, but 4 mm. broad.—*C. Californica* C. A. Meyer.

Hab. From Southern California to Vancouver Island and British Columbia.

Specimens examined: California (*Nuttall, Bolander, Torrey, Parry* 67 in part, *Brewer* 102, 434, *Nevin, Kellogg and Harford* 323, *Greene, Lemmon* 694, *Palmer* 98, 116, *Pringle* of 1882, *Mrs. Ames, Jones, G. R. Vasey*, etc.); Oregon (*Lyall, Hall* 221, *Kellogg & Harford* 322, *Howell* 177); Washington (*Cooper, G. R. Vasey* 226); Vancouver Island (*Lyall, Macoun, Cowley*); British Columbia, Thompson river (*Fletcher*), Columbia Valley (*Macoun*).

We can discover no good specific characters to separate *C. Californica* from *C. pubescens*, and must consider the former to be a rather poorly distinguished variety of the latter. The Rocky mountain species heretofore frequently referred to *C. pubescens* is *C. stolonifera*. For remarks as to the affinities of this species see under *C. stolonifera*.

13. **C. Baileyi.** Erect shrub, with reddish-brown mostly smooth branches: branchlets and inflorescence pubescent to woolly: petioles 6 to 25 mm. long; leaves from lanceolate to ovate, acute or short acuminate, acute or obtuse at base, appressed-pubescent to glabrate above, white beneath and with woolly hairs variously intermingled with appressed ones (or in some cases all appressed), 2.5 to 12 cm. long, 1.2 to 7.5 cm. wide: flowers in small rather compact cymes: calyx-teeth from small to prominent: fruit white; stone decidedly compressed,

flat-topped, rarely oblique, with a very prominently furrowed edge, much broader than high (3 mm. high, 4 to 6 mm. broad).

Hab. About the Great Lakes and westward to head waters of the Saskatchewan and Wyoming.

Specimens examined: Presque Isle (*Garber*); Point Pelee (*Macoun* 102); Michigan, South Haven (*L. H. Bailey*); Minnesota, north shore of Lake Superior, Vermillion Lake, and Hunter's Island (*L. H. Bailey* 12, 36, 250); Lake Nipigon (*Macoun* 2242); Lake Winnipeg Valley and the Saskatchewan (*Bourgeau, Dawson*); N. W. Territory, Cypress Hills (*Macoun* 149); Wyoming Territory, near Ft. Bridger (*Porter*, distributed as *C. pubescens*).

This species has been confused with *C. stolonifera*, *C. sericea*, and *C. pubescens*, and it certainly bears no little resemblance to *C. asperifolia*. The appressed-pubescence was taken to indicate *C. stolonifera*, and the woolly hairs were thought to point to *C. sericea* or *C. pubescens*. It differs from *C. asperifolia* in its mostly glabrate upper leaf-surface, white lower leaf surface, and much compressed deeply furrowed stone, which is much broader than high. It differs from *C. stolonifera*, with which it has been mostly confused in herbaria, not only in the woolliness of the lower leaf-surface, but very strikingly in the stone characters just enumerated. It resembles *C. sericea* so little that a statement of the differences would be a repetition of all the specific characters. Its stone most resembles that of the western *C. pubescens*, but it is larger and more compressed and the pubescence of the leaves is entirely different. For further discussion of relationships see under *C. stolonifera*. The range is very obscure as yet. We suspect that it extends far to the northwest in British America, and probably decends again into the United States along the Rocky Mountain and Pacific ranges to still further increase the confusion of species in our extreme northwestern states. Only an extensive collection of fruiting specimens can settle this question, for the combination of pubescence and stone characters can not fail to distinguish *C. Baileyi*. We dedicate the species to Professor L. H. Bailey, whose abundant material from Michigan and Minnesota has enabled us to characterize it, and who also has called attention to it in his remarks under *C. stolonifera* in Bulletin 3, Minn. Geol. and Nat. Hist. Survey, p. 14.

Crawfordsville, Ind.

New mosses of North America. III.

F. RENAULD AND J. CARDOT.

(WITH PLATES V–VII.)

Dicranella Langloisii.—Cespitose, pale or yellowish green. Stems short, 4–7 mm. long. Leaves small, .75–1.25 mm. long, .25–.35 mm. broad, crowded, erect-spreading when moist, appressed when dry, from an oblong base shortly acuminate, blunt at the denticulate apex, strongly revolute on one side, slightly reflexed or almost plane on the other; costa stout, broad, percurrent, rounded at back; cells of the areolation short, rectangular or subrectangular below, elongated, 4–7 times longer than broad above. Perichætial bracts longer, longer acuminate; costa shortly excurrent. Pedicel purple, 5–7 mm. long. Capsule suberect, oblong, incurved, reddish-brown, constricted under the orifice when dry, 1 mm. long, .35–.50 mm. broad; lid large, highly convex-conic, with an oblique beak. Peristome purple, high, teeth bifid to above the middle; annulus none.

Louisiana: Saint Martinville, on the ground at the roadsides (*A. B. Langlois*).

Allied to D. varia, but readily distinguished by the stronger habit, the leaves much shorter and more shortly acuminate, obtuse or subobtuse and denticulate at the apex, the rounded costa and the shorter cells of the areolation.

Dicranum falcatum Hedw. var. **Hendersoni.**—Pedicel purple below, yellow above.

Oregon: Mt. Hood, moist sunny rocks (*L. F. Henderson*).

Dicranum consobrinum.—Densely cespitose, yellowish green. Stems erect, simple or dichotomous, tomentose, 5–8 cm. long. Leaves rather crowded, secund or erecto-patent, narrowly lanceolate-subulate, serrate in the upper half, 6–7 mm. long, .75–1 mm. broad at base; costa serrate at back toward apex; cell-walls porose, scarcely thickened. Perichætial bracts sheathing, truncate or emarginate at apex, sometimes muticous, generally tipped with a short or little elongated subula. Pedicel yellow, subflexuous, 2–3 cm. long. Capsule cernuous or horizontal, narrowly cylindraceous, curved, not sulcate, long attenuate below, rufescent when old, 3.50–4 mm. long, .50–.75 mm. broad; lid long subulate. Male plants gemmaceous, nidulant in the tomentum of the female stems.

Minnesota (comm. *Joseph Henry*).

This moss, belonging to the group of D. scoparium, is characterized by its very narrow capsule, not sulcate when empty and its perichætial bracts often emarginate, sometimes muticous or with a shorter subula than in D. scoparium.

Fissidens obtusifolius Wils. var. **Kansanus.**—Differs from the typical form in its leaves with a broad border of elongated cells on the margins of the vaginant lamina, and a narrow, more or less distinct border on the dorsal wing.

Kansas: Saline county (*Joseph Henry*).

Didymodon Hendersoni.—In compact tufts, yellowish above, ferruginous below. Stems erect, branched, 1–2 cm. long. Leaves crowded, patulous when moist, subincurved, erect-imbricate in dry state, ovate- or oblong-lanceolate, entire, .75–1.25 mm. long, .35–.50 mm. broad; apex rounded-obtuse or minutely apiculate or subacute; borders revolute but flat below the point; costa stout, rufescent when old, vanishing at or below apex; cells of the areolation small, distinct, thick-walled, irregular, roundish-quadrate, minutely papillose, the lower rectangular, rather elongated toward costa, quadrate or transversely dilated on the borders. Perichætial bracts not sheathing, oblong-lingulate, obtuse at apex. Pedicel reddish, twisted to the left above, 10–12 mm. long. Capsule erect, cylindrical, badious when old, 2–2.50 mm. long, .35–.50 mm. broad; lid obliquely rostrate. Peristome unknown.

Oregon: Milwaukee, crevices of rocks (*L. F. Henderson*).

This species is nearly allied to *D. luridus* Hsch., from which, however, it is readily distinguished by the yellowish tint, the more slender stems, the longer and paler pedicel, and chiefly by the narrower and more elongated capsule, of a looser areolation of longer and more incrassated cells. From European *D. Lamyi* Sch. it differs also in the form and areolation of the capsule, and, besides, this last species has the leaves more acute, with more elongated basilar cells.

Grimmia tenerrima.—In small, compact, gray tufts. Stems short, 2–6 mm. long. Leaves small, .75–1.25 mm. long, .25–.35 mm. broad, oblongo-lanceolate, the lower muticous or with a short hyaline point, the upper prolonged into a smoothish hair; borders generally reflexed in the upper part; costa canaliculate; basilar cells of the areolation lax, quadrate, pellucid, thin-walled, the upper bistratose, subquadrate

with scarcely thickened walls. Capsule exserted on a short, pale pedicel, small, leptodermous, smooth, yellow or pale brown, .75–1 mm. long, .35–.50 mm. broad; lid convex-apiculate. Peristome orange-red, teeth patulous when dry, papillose, perforated, more or less lacerate at apex. Calyptra cucullate. Male flowers unknown.

Oregon: Mt. Hood, moist bluff towards the snow-line (*L. F. Henderson.*)

This moss, one of the smallest of the genus, is closely allied to *G. alpestris* Schleich., from which it is distinguishable by the smaller size, the shorter capsule and the cells of the areolation larger, with scarcely thickened walls.

Phacomitrium heterostichum Brid. var. **occidentale.**—A remarkable form, characterized by the stems often nearly simple, the pedicel very short, 3–4 mm. long, the capsule small, pale, not shining, and the paler peristome. Perhaps a subspecies.

Oregon; Lost Lake, on rocks (*L. F. Henderson*).

Coscinodon Renauldi Card.—In small, compact, gray or greenish tufts. Stems erect, simple or dichotomous, short, 3–8 mm. long. Leaves small, erecto-patent when moist, imbricate when dry, broadly ovate-lanceolate, rather suddenly acuminate, .75–1 mm. long, .35–.70 mm. broad; costa stout, canaliculate, running out into a long, flexuous, hyaline, slightly toothed hair; borders plane, very entire, rarely sinuate or subdenticulate toward the base of the hair-point; cells of the areolation lax, quadrate, hyaline at base, roundish-quadrate, chlorophyllose, thick-walled in the upper part. Capsule immersed on a very short pedicel, small, globose when young, then ovate-oblong and becoming oblong-subcylindrical and truncate at base when old and empty, leptodermous, soft, 1 mm. long, .35–.50 mm. broad; lid conic, acuminate. Peristome orange or yellow, teeth granulose, very cribrose or cleft into 3–4 coherent legs. Calyptra large, sulcate, lobulate at base, covering nearly the whole capsule, or at least descending to below the middle. Male flowers gemmiform, axillary below the female.

Kansas: Saline county (*Joseph Henry*). Colorado (*Mrs. Roy*, kindly communicated by Mrs. E. G. Britton).

Seems to be closely allied to *C. Raui* Aust. (of which we have seen no authentic specimen), but according to the description given in Lesquereux and James's *Manual*, 155, this last species has the costa "vanishing below the slightly erose-dentate apex of the leaf" and the teeth of the peristome "en-

tire, split merely or perforated here and there on the line of division," while in our moss the leaves are nearly always entire at apex, with the costa distinctly passing into the hair-point and the teeth of the peristome very cribrose. Sometimes the hair is greenish at base or, on the contrary, slightly decurrent. It is only on stunted and diseased stems that we have seen the leaves slightly sinuate-denticulate and hyaline at apex, as in *C. Wrightii* Sull., which, on the other hand, is easily distinguished from *C. Renauldi*, just as from *C. Raui*, by its leaves shortly oval or suborbicular and more suddenly constricted at apex.

Orthotrichum Hendersoni. (*Ulota Hendersoni* Ren. and Card. MSS.).—Pulvinate, yellow-green. Stems dichotomous, 1–2 cm. long. Leaves patulous, flexuose when moist, slightly crispate when dry, from an oblong base linear-lanceolate, acuminate, carinate, 2.50–3 mm. long, .35–.50 mm. broad, borders strongly revolute; costa vanishing below apex; cells of the areolation thick-walled, elongated, subrectangular below, roundish or angular, papillose in the upper part. Capsule subexserted on a short pedicel, oval-oblong, suddenly constricted to the pedicel, 8-striate, 1.50–2 mm. long, .50–.75 mm. broad, becoming cylindraceous and contracted below the mouth when old and empty; stomata immersed; lid convex, apiculate, teeth 8, bigeminate, yellow, minutely granulose, not striolate lengthwise, reflexed when dry, split at apex; cilia 8, smooth; vaginula hairy. Calyptra unknown. Spores papillose. Monœcious. Male flowers on a lateral branch.

Oregon: Coast Mts., on bushes (*L. F. Henderson.*)

On account of the crispate leaves in dry state, this moss has the facies of an Ulota, but it is allied to *Orthotrichum stramineum* Hsch. and *O. Rogeri* Brid., differing from the first in the narrower, longer, flexuose leaves, twisted and slightly crispate when dry, the longer pedicel, the shorter hairs of the vaginula, the teeth of the peristome more elongated, of a darker yellow, merely split but not cribrose-lacerate at apex; and from the last, in the twisted leaves, not excavate at base, and the capsule suddenly contracted below.

Orthotrichum ulotæforme. (*Ulota glabra* Ren. and Card. MSS.).—Pulvinate, yellow-green. Stems dichotomous, 1–2 cm. long. Leaves patulous, flexuose when moist, slightly crispate when dry, from an ovate-oblong base linear-lanceolate, acuminate, carinate, about 3 mm. long, .50 mm. broad; borders strongly revolute, sometimes sinuate at apex; costa

vanishing below apex; cells of the areolation incrassate, lower elongated, narrow, subsinuose, upper roundish or subhexagonal, slightly papillose. Capsule exserted on a long pedicel (4–6 mm.), oblong, 2 mm. long, .75 mm. broad, 8-striate when dry, suddenly contracted to the pedicel; stomata immersed; lid depressed, rostrate. Teeth 8, bigeminate, or 16 more or less connected in pairs, pale yellow, minutely granulose, striolate lengthwise, truncate and split at apex, reflexed when dry; cilia 16, long, nodulose, nearly smooth. Calyptra large, plicate, naked, smooth, lobulate at base. Spores papillose. Flowers monœcious.

Oregon: Coast Mts., on bushes, with the preceding species (*L. F. Henderson*).

The leaves crispate when dry and the long pedicelled capsule give to this moss quite the facies of an Ulota, but the large, naked calyptra, lobulate at base, and the immersed stomata, compel us to place it among the Orthotricha. Mr. Venturi thinks that it may be proved identical with *O. columbicum* Mitt., but according to the description given by Mr. Mitten in *Journ. Linn. Soc.* viii, 26, this is a quite distinct species, of smaller size, with the capsule short pedicellate and only 8 cilia to the inner peristome. Sullivant considers it as a variety of *O. pulchellum* Brunt. (Cfr. Lesquereux and James, *Manual*, 175).

Orthotrichum pulchellum Brunton var. **productipes.**—Much more robust than the type, with larger leaves, a longer pedicel (4–6 mm.), and the teeth of the peristome larger and paler.

Oregon: Portland, trees and shrubs (*L. F. Henderson*).

Perhaps identical with the *O. pulchellum* var. *longipes* Sull., but the description of this last variety, in *Manual*, 175, is too incomplete to allow a positive identification.

Funaria calcarea Wahl. var. **occidentalis.**—Differs from the type in the leaves mere shortly and broadly acuminate and the longer pedicel (16–22 mm.).

Oregon: Oregon City, wet mud-banks (*L. F. Henderson*).

This plant closely resembles the *F. convexa* Spr., from south Europe, which is also merely a var. of F. calcarea; it differs only from it in the longer pedicel and the capsule a little narrower.

Webera cruda Sch. var. **minor.**—Differs from the type in the much smaller size, the narrower capsule and the conic lid.

Oregon: without locality (*L. F. Henderson*).

Bryum Hendersoni. — In robust, yellowish-green tufts. Stems robust, purple, tomentose, erect, dichotomous, 2–4 cm. long. Lower leaves distant, smaller, then becoming gradually larger, upper 3–5 mm. long, 1.50–2 mm. broad, crowded, erecto-patulous when moist, loosely appressed when dry, concave, cucullate at apex, broadly obovate-lanceolate or oblong-subspatulate, short acuminate and reflexed-apiculate by the excurrent costa; margins narrowly revolute, but flat toward the point, strongly serrate above; cells rectangular at base, the lower reddish, oblong-hexagonal in the middle, ovate-hexagonal or rhomboidal in the upper part, the marginal elongated, linear-flexuose and forming a more or less distinct border, generally denticulate above on the back by the prominence of the cell-apices. Pedicel reddish, 3–4 cm. long. Capsule inclined or pendulous, narrowly cylindrical, incurved, constricted below the mouth and tapering to a long attenuate neck; lid convex or subconic, apiculate, teeth yellow, densely trabeculate; segments split; cilia 1–3, appendiculate. Annulus very broad, of 3–4 rows of cells. Seems to be diœcious. Male flowers unknown.

Oregon: Portland, moist sunny bluffs (*L. F. Henderson*). California (*Mrs. Ames*).

Closely allied to *B. provinciale* Philib., of which it is perhaps a subspecies, but differing in the larger size, the leaves more concave, cucullate at apex, with a reflexed apiculus, the margins more strongly serrate above, with a border generally denticulate on the back, and the longer, narrower capsule on a longer pedicel.

Monaco and Stenay, France.

EXPLANATION OF PLATES V, VI, VII.—Nearly all the figures drawn by means of Nachet's camera lucida:

PLATE V.—A. *Dicranella Langloisii. a*, entire plant; *b*, leaves; *c*, basal areolation; *d*, areolation of the upper part; *e*, leaf-point; *f*, perichætial leaf; *g*, capsule with the lid; *h*, the same deoperculate.—B. *Dicranum consobrinum. a*, entire plant; *b*, upper part of the perichætium; *c, c*, point of perichætial bracts; *d*, capsule.—C. *Didymodon Hendersoni. a*, entire plant; *b*, lower leaf; *c, c*, upper leaves; *d, d, d*, point of the same; *e*, basal areolation, on the margin; *f*, areolation of the upper part; *g*, perichætial bract; *h*, capsule; *i*, areolation of the capsular membrane; *i**, *i**, ditto of D. luridus.

PLATE VI.—A. *Grimmia tenerrima. a*, entire plant; *b, b*, lower leaves; *c*, upper leaf; *d*, basal areolation; *e*, areolation of the upper part: *e**, ditto of G. alpestris; *f, f*, capsules; *g*, portion of the peristome.—B. *Coscinodon*

Renauldi; *a*, entire plant; *b*, the same enlarged; *c*, lower leaf; *d*, *d*, *d*, upper leaves; *e*, basal areolation; *f*, areolation of the upper part; *g*, transverse section of a leaf, in the upper part; *h*, young capsule; *i*, capsule, old and empty; *j*, portion of the peristome; *k*, calyptra.—C. *Funaria calcarea* var. *occidentalis*. *a*, entire plant; *b*, leaf.

PLATE VII.—A. *Orthotrichum Hendersoni*. *a*, entire plant; *b*, leaf; *c*, capsule; *d*, the same, old and empty; *e*, stoma; *f*, portion of the peristome.—B. *Orthotrichum ulotæforme*. *a*, entire plant; *b*, *b*, leaves; *c*, basal areolation; *d*, areolation in the upper part; *e*, capsule; *f*, the same, old and empty; *g*, stoma; *h*, portion of the peristome; *i*, calyptra.—C. *Bryum Hendersoni*. *a*, entire plant; *b*, leaves; *c*, upper part of a leaf; *d*, areolation of the apex; *e*, capsule.

Errata in preceding notice:

Page 96, line 5 below, instead of *branches*, read *branchlets*.

Page 96, line 6 below, instead of *nate*, read *long*.

Page 100, line 2, instead of *is*, read *closely*.

Plate XIII, C, add to the figure most to the right: d. $\frac{24}{1}$.

BRIEFER ARTICLES.

Poisonous action of Clathrus columnatus.—The odor of fully grown specimens of the order Phalloideæ is so repulsive that the question as to their poisonous character when eaten by men has not often been the subject of experiment. Most writers previous to Krombholz took it for granted that the common stink-horn, Phallus impudicus, was poisonous. The experiments of Krombholz on the canary bird, the tortoise, the dog, and on man, showed, however, that the fungus was not poisonous in those cases. Harzer apparently followed the statements of Krombholze, and more recently Goeppert says of Phallus impudicus that it can be eaten without harm, although he does not state the grounds of his belief. The lattice-fungus, Clathrus cancellatus, which has an odor as disagreeable as that of the rest of the order, is known to have proved poisonous in at least one case; that of a young girl who ate a small piece of the fungus, and was seized with violent convulsions followed by loss of speech and a deep sleep lasting 52 hours.

On October 31, 1889, I received a letter from Prof. Gerald McCarthy of Raleigh, N. C., saying that a number of hogs in that State had been killed by eating a fungus of which he wrote as follows: "It grows in patches in oak woods and openings and is greedily sought after and eaten by hogs who are generally killed by it within 12 or 15 hours." On the arrival of the specimen it proved to be one of the Phalloideæ, but the species could not be determined from the material sent and application

was then made for more of the poisonous fungus to Mr. G. W. Lawrence, of Fayetteville, N. C., and from the material sent by him the species was recognized as *Clathrus columnatus* Bosc. As the fungus is common to the Southern States, it would be interesting to know whether the hogs of other States possess the same fondness for this most extraordinary diet.

In this connection I should like to call attention to an admirable memoir on Phalloideæ[1] by Dr. Ed. Fischer of Berne. He considers *C. columnatus* Bosc. to be merely a variety of *C. cancellatus* Tournef. He also places *C. triscapus* Mont., which occurs in Florida, under the same species as var. *Brasiliensis*. *Simblum rubescens* Gerard together with var. *Kansensis* Cragin are merged in *Simblum sphærocephalum* Schlecht. *Phallus duplicatus* Bosc, *P. Dæmonum* (Rumpf), *P. collaris* Cragin and Hymenophallus togatus are referred to *Dictyophora phalloides* Desvaux, thus bringing all the indusiate forms of the United States under one species. The synonymy of our species of Mutinus is still perplexing, for the original descriptions and type specimens are not sufficient to show clearly the limits of several species.—W. G. FARLOW, *Cambridge, Mass.*

Chlorophyll in the embryo.—The GAZETTE has mentioned Dr. Campbell's note on chlorophyll in the embryo of Celastrus. Other examples may be found in Tilia Americana and Ipomœa purpurea. I have given some attention to the latter during the last five months. In its earliest stages the embryo is white. The chlorophyll appears as soon as the first traces of the cotyledons can be recognized by the eye in the cross-section of the seed. It is abundant in the cotyledons while the pod is developing. When the fruit is ripe and the pod begins to dry then the color diminishes and becomes a light yellow in the shrunken seed which drops to the ground at the time of dehiscence. If the pods and their contents be buried in earth while yet green and immature they promptly send up thrifty plants which come to flower and produce fertile seeds, thus shortening the life-circle of the plant and giving it no "resting stage." I learn that some gardeners have taken advantage of this fact in burying "green peas" in the pod instead of the seed of a previous year, thus obtaining a more speedy result. I would be glad to know if observers in more southern localities find that Ipomœa, when favorably situated, produces its new seedlings by a natural or accidental burial of the pod without its arrival at maturity.—C. B. ATWELL, *Evanston, Ill.*

EDITORIAL.

PROBABLY no more earnest and critical notice of the BOTANICAL GAZETTE has appeared in any extra-English publication than that in a late number of *Flora* by its able and scholarly editor, Prof. Dr. Goebel. He gives as his reason for writing the notice that the GAZETTE "affords an

[1] Untersuchungen zur vergleichenden Entwicklungsgeschichte und Systematik der Phalloideen. *Denkschrift Schweiz. Naturf. Gesell.* Band 32. I.

insight into the botanical activity of America," and from this standpoint he has indicated a foreign estimate of American botany. As our readers will doubtless be interested in the opinion of so eminent a writer, we reproduce in English form part of the review; it seems to us to contain important suggestions. "It lies in the nature of things," Dr. Goebel says, "that up to the present time only a little, comparatively, has been known in Germany of the scientific life of the United States; it has in fact but just begun to bloom, and is of recent date as contrasted with that of the old world. The works of Asa Gray, Engelmann and others are quite generally known, in connection with the admirable reports of the Geological Surveys, but much less is known of the Universities and their Institutes, which are constantly becoming more numerous through magnificent bequests and endowments. There can be no doubt that the literary productions in the domain of botany will soon rise into importance in a land that not only itself possesses a highly interesting flora, but also has the enviable advantage of lying very near tropical regions, so that one may reach Mexico from New York, for example, in less than a week." It is evident that the German botanical mind is in a receptive condition toward American botany, and that it already recognizes superior natural and acquired advantages for the study on this side the water. The reviewer furthermore gives us credit for "a strong endeavor to take advantage of the experience of European botanical institutes." Passing to a consideration of the work being accomplished, "one generally misses," he says, using the GAZETTE for 1888 as the text for this comment, "the connection with the literature of the subject treated (*e. g.*, in the articles of Newcombe and Evans), although the treatment of the literature as known in European botanical publications often leaves much to be desired." The two articles cited emanated from two of our prominent botanical laboratories, and between them contain but one reference to literature, although treating of interesting subjects on which much work of the same or similar nature must have been done. If, however, German authors themselves do not do their full duty in the matter of citations, in the opinion of this able critic, it is no wonder that so great a defect in American writers made it easy and natural for him to pass on without specially commending their productions. The GAZETTE, he says, "will be the more valuable for European readers the more it succeeds in giving the most complete survey possible of all botanical publications of America. Especially to be desired also would be yearly summaries of all American publications in the domain of botany." This suggestion is manifestly outside the sphere and the present ability of the GAZETTE, but it would be a most admirable and suitable work to be taken up by the National Herbarium. No annual resumé of botanical activity in America, after the manner of the excellent year-books of Germany, *e. g.*, Just's *Jahresbericht*, has ever been attempted, but there can be only one opinion of its great service to both American and foreign investigators.

CURRENT LITERATURE.

Minor Notices.

A NEW, revised, and enlarged edition of Dr. George Vasey's catalogue of the agricultural grasses and forage plants of the U. S. has just been issued. There has been such a large demand for this valuable bulletin that a new edition became necessary. The present edition contains 148 pages and 114 plates.

DR. GEORGE LAWSON has published, as an appendix, a school edition of the fern-flora of Canada. A brief account of the general character and parts of ferns is given, followed by a classification of Canadian ferns, with a full account of their localities. A plate illustrates the principal genera and makes them comparatively easy of identification. We would suggest that the work would have commended itself more to "schools" had there been inserted a few simple keys to genera and species.

DR. L. N. BRITTON has published a revision of the genus Eleocharis in N. America, distributed as Contribution 12 from the Herbarium of Columbia College, but reprinted from the *Jour. N. Y. Micr. Soc.* vol. 5, no. 4. So far as the range of Gray's Manual is concerned we note the following changes: E. equisetoides of the Manual=*E. interstincta* R. & S.; E. quadrangulata=*E. mutata* R. & S.; E. obtusa=*E. ovata* R. & S.; E. simplex=*E. tortilis* Sch.; E. compressa=*E. acuminata* Nees. Altogether, 40 species are enumerated, including a new one (E. Parishii) from S. California.

NOTES AND NEWS.

MR. T. S. BRANDEGEE and wife are making further explorations of the flora of Lower California.

PROF. C. S. SARGENT gives a full and illustrated account of Celtis occidentalis in *Garden and Forest* for January 22.

DR. FERDINAND HAUCK, the distinguished algologist, died at Trieste on the twenty-first of December, at the age of forty-four.

DECADES V and VI of Hepaticæ Americanæ, by Underwood & Cook, are announced as ready for distribution. All the sets of the first four decades are exhausted.

MR. G. C. NEALLEY made a large collection of plants of extreme Western Texas during the last season. They will be issued from the Department of Agriculture.

THE AMERICAN NATURALIST is to the front again with its initial number for 1890. It gives promise of renewed life, and its array of editors speaks well for the different departments.

MR. F. H. KNOWLTON, of the Smithsonian Institution, made a good collection of the plants of the San Francisco Mountains, Arizona, last season, which we hope will presently appear in printed form.

BOTANISTS everywhere are reporting the results of our mild winter in calling forth spring flowers. The Washington botanists report the collecting of over twenty spring flowers in January, including Epigæa.

ERNEST COSSON died in Paris, December 31, 1889, in his 69th year. His name is especially connected with the Algerian flora, although in his earlier years he published a flora of the suburbs of Paris, which has gone through three editions.

MR. FRANK TWEEDY, of the U. S. Geological Survey, is always finding rare and new plants in connection with his regular work. He has done much in bringing to light the rarities of the Montana flora. Some of his recent discoveries will soon be published.

THE AMOUNT OF MATERIAL being collected at the Department of Agriculture for the study of North American grasses is really enormous. It is to be hoped that both time and strength will be given to Dr. Vasey to publish fully the results of his many years of study.

IN *Forest Leaves* (Jan.) Dr. Rothrock writes of a puzzling walnut tree growing on the Row Farm, on the northern bank of the James River "a good day's sail above Newport News." It is a gigantic tree, and has been called J. cinerea, J. nigra, J. regia, and a hybrid between the last two. Professor Rothrock seems not to have settled the puzzle.

THE DISCOVERY of Liriodendron Tulipifera in Western China by Dr. Henry is a striking confirmation of Dr. Gray's essay concerning the close relationship between the floras of Eastern North America and Eastern Asia. This Chinese tulip tree seems in no way different from its American representative, although reports so far do not give it such height.

THE BULLETIN of the Agric. Exper. Station of Nebraska, issued December 18, 1889, contains five papers, viz.: The smut of wheat and oats, by J. C. Arthur; The smut of Indian corn, by C. E. Bessey; A preliminary enumeration of the rusts and smuts of Nebraska, by H. J. Webber; Notes on fungi of economic interest observed in Lancaster county, Nebraska, in 1889, by Roscoe Pound; Observations on Populus monilifera, by A. F. Woods.

THE *Bulletin of the Torrey Botanical Club* for January contains much interesting matter. F. V. Coville publishes, with plate, a revision of the U. S. species of Fuirena, of which there are three, with a new variety for F. squarrosa. E. L. Greene, in his bibliographical notes, replaces *Rhus aromatica* Ait., by the older *R. Canadensis* Marshall, and describes a new variety of it from N. Arizona; he also replaces *Rubus Nutkanus* Moc. by *R. parviflorus* Nutt., apparently a very inappropriate name. N. L. Britton describes a new Rhexia from Egg Harbor City, New Jersey. Thos. C. Porter describes new varieties of Arabis lævigata, Fragaria vesca, Rubus villosus, and Aster prenanthoides.

THE SUDDEN DEATH on Tuesday, December 3d, of W. R. McNab is announced. Dr. McNab, the son and grandson of the distinguished curators of the Royal Botanic Garden at Edinburgh, was at the time of his death Professor of Botany at the Royal College of Science, Dublin, and the director at the Botanic Garden at Glasnevin. He was distinguished by his investigations in physiological botany and the minute anatomy of plants, both recent and fossil. Dr. McNab is, perhaps, best known by his researches into the minute anatomy of the leaves of conifers. He has for many years been an active and successful teacher. —*Garden and Forest.*

DR. EDWARD PALMER is at present collecting for the Department of Agriculture in Lower California. He will try to reach Cape St. Lucas and work northward, spending the latter part of the season in Arizona.

THE KEW BULLETIN for January is entirely taken up with an account of the somewhat famous "weather plant" (*Abrus precatorius* L.). Great claims had been made for it, that by certain movements and positions of its leaflets it could forecast with certainty weather 48 hours in advance, such as sunshine, rain, wind, storm, etc., and even subterranean disturbances. The whole matter has been investigated at Kew, and the results published in this bulletin. The movements are those with which we are familiar in many leguminous plants, but the certainty of its predictions is not so clear. For a condensed account of the plant and of the Kew experiments see *Gardeners' Chronicle* for January 25.

SINCE THE DISCOVERY of the sieve tissue by Hartig, a little more than fifty years ago, it has been repeatedly studied. Nägeli, Wilhelm, Russow, Janczewski and Fischer have made it the subject of special memoirs, and various authors have treated it in connection with other tissues of the cortex. In the last numbers of the *Annales des Sciences Naturelles* (*Botanique*)[1] Mr. H. Lecomte publishes a "Study of the liber of Angiosperms," which is a valuable contribution to our knowledge of the tissues which compose it. Amongst other things he states that in the bast of the leaves the sieve tubes are always of the gourd type, no matter what their form in the stem. The same is true of them in the primary bast of the stem. The partition destined to become a sieve plate is from the first not homogeneous, but the cellulose is developed along the bands between the meshes of the sieve which subsequently become perforations. (This primitive wall Mr. Lecomte thinks is not cellulose, and perhaps only pectate of lime, such as that described by Mr. Fremy forming a sort of cement between the parenchyma cells.) The callus which covers the functionless sieve plates is an exaggerated development of the delicate membrane which covers the cellulose part of the plate. While the nucleus generally disappears at a certain time, it can sometimes be seen later in the parietal protoplasm of active tubes. The protoplasm of active tubes is living, surrounding a large vacuole filled with water containing proteid substances in solution; the tubes are therefore not dead elements. It will perhaps bear repetition, though not a discovery of Mr. Lecomte, that the accumulation of the albuminoids at the ends of the tubes as commonly seen in alcoholic material, is wholly a *post mortem* appearance. The transport of the albuminoids must be greatly aided by the proper movements of the protoplasm.—We have summarized only a few of the more important results of Mr. L. Here is a paper that should not be neglected by any histologist.

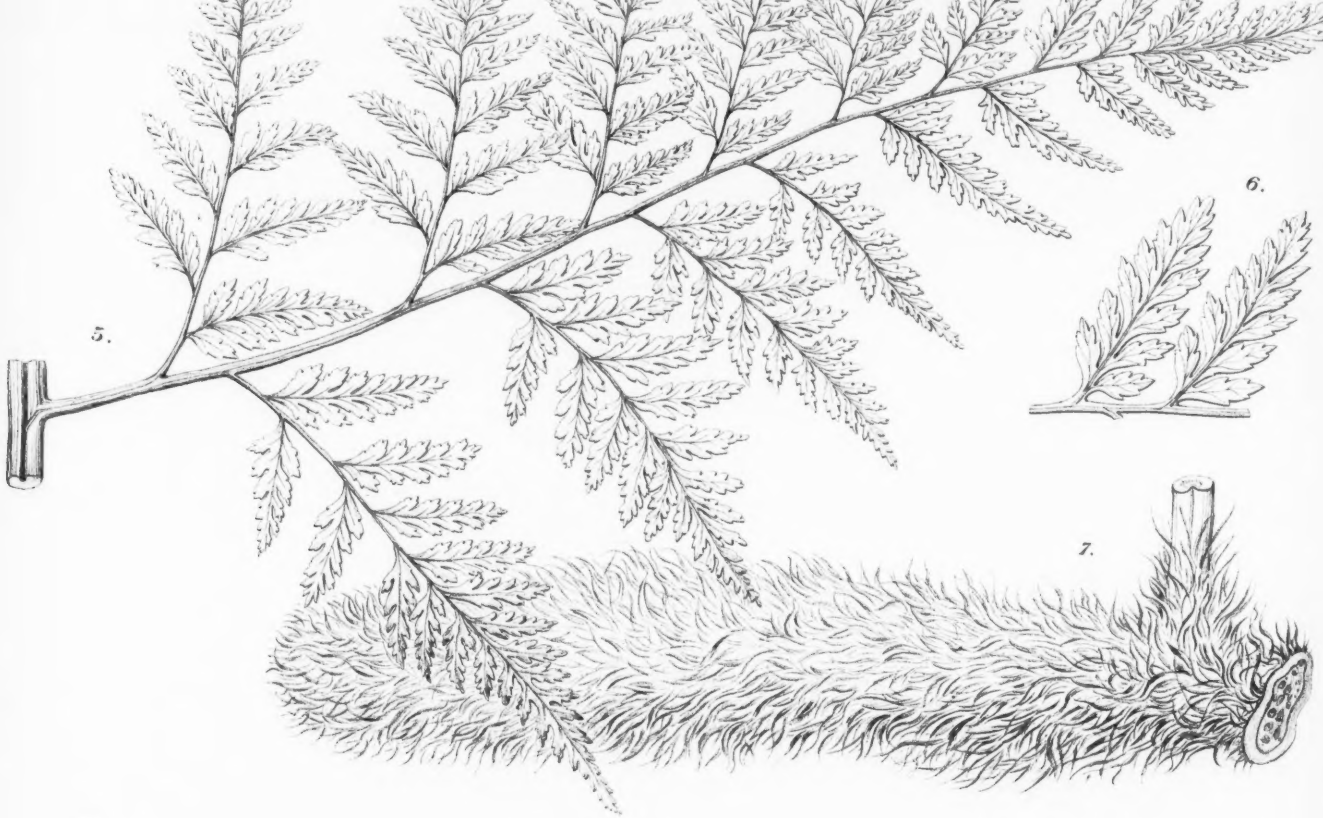
THE PERIDERM, too, comes in for its share of the observations. A long paper in the same serial by Mr. H. Douliot details his study of its development in a large number of plants. Möller has already distinguished four cases: (1) The phellogen formed from the epidermis itself; (2) from the layer immediately under the epidermis; (3) from a deep-lying layer of the cortex; and (4) in the vascular bundle itself. Douliot further distinguishes two cases instead of the fourth (*a*) the formation of the phellogen from the endodermis; (*b*) from the pericycle.

[1] Nos. 4, 5, 6, vol. x, pp. 193-324.

C. E. Faxon, del

CAMPANEA PICTURATA, n. sp.

B. Meisel, Lith. Boston.

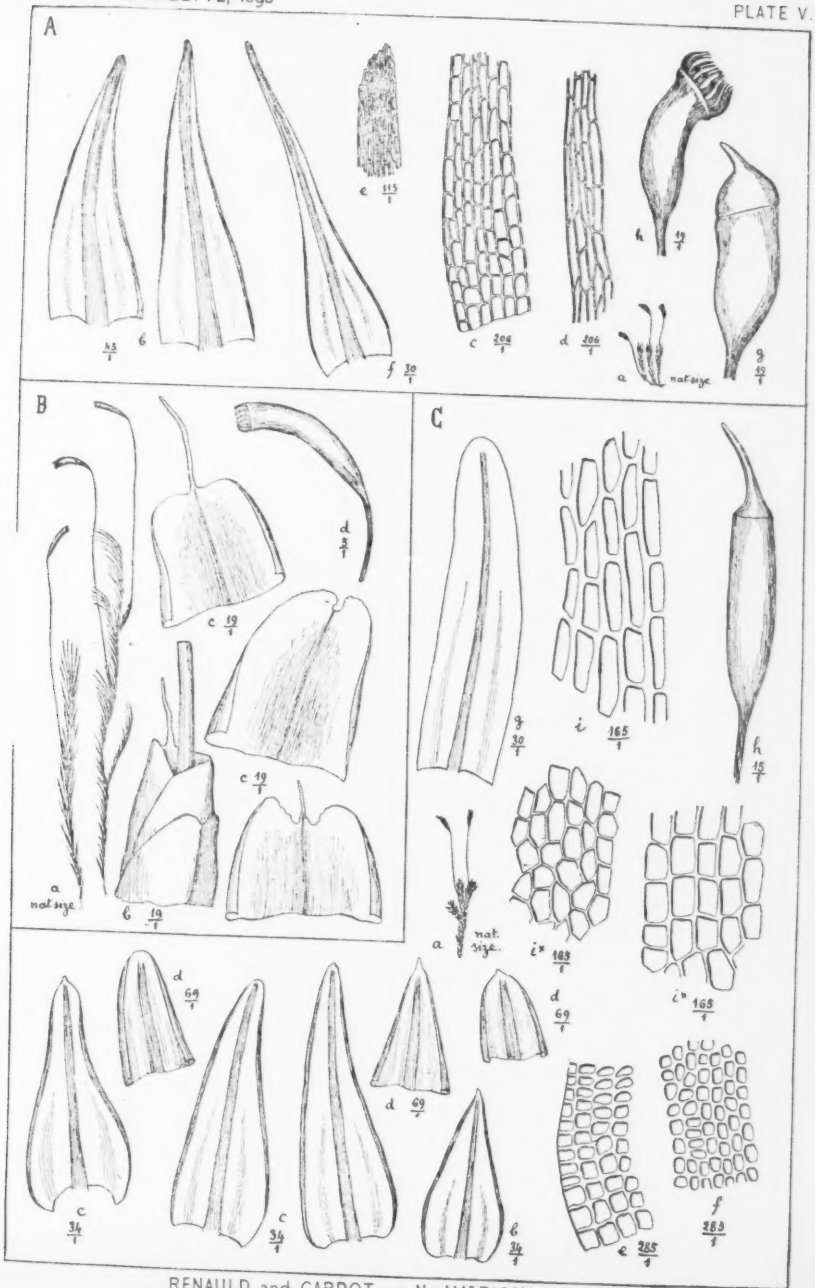


C.E. Faxon, del.

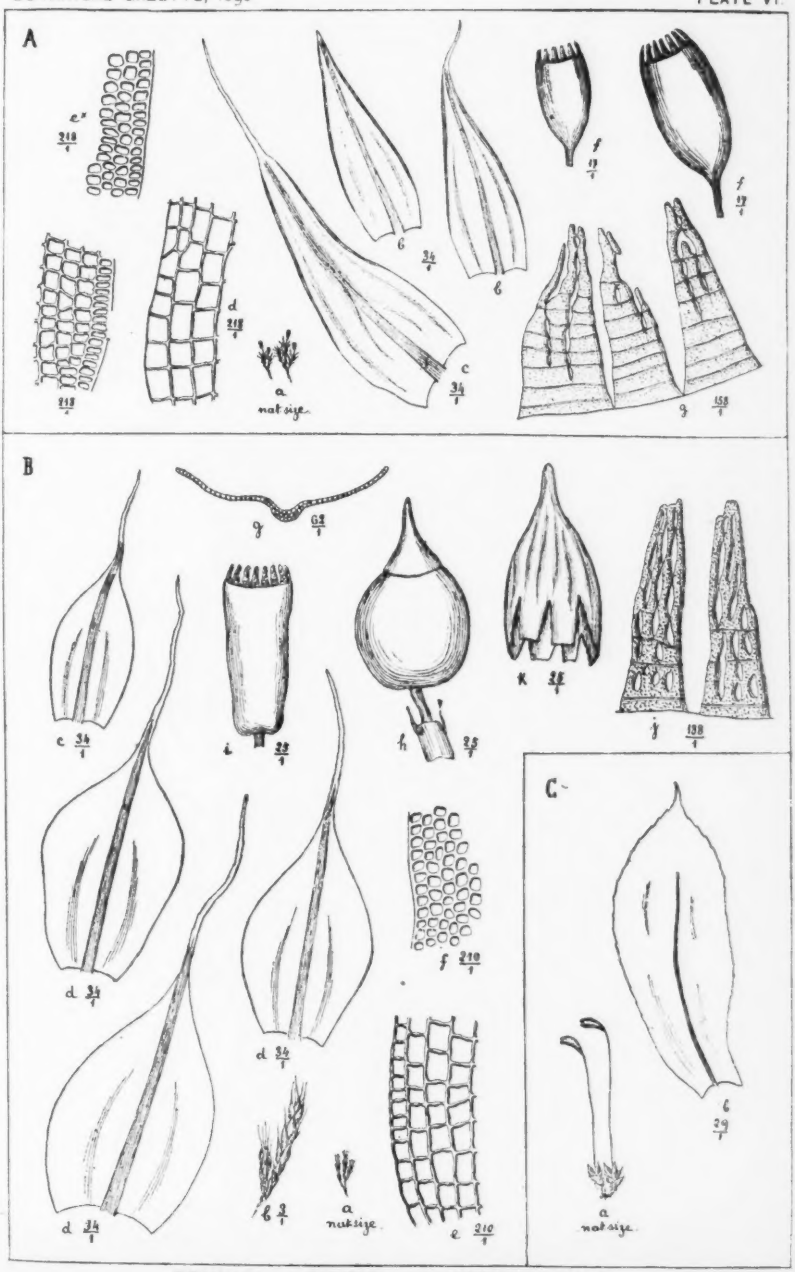
NEPHRODIUM DUALE, n. sp.

B. Meisel, Lith. Boston.

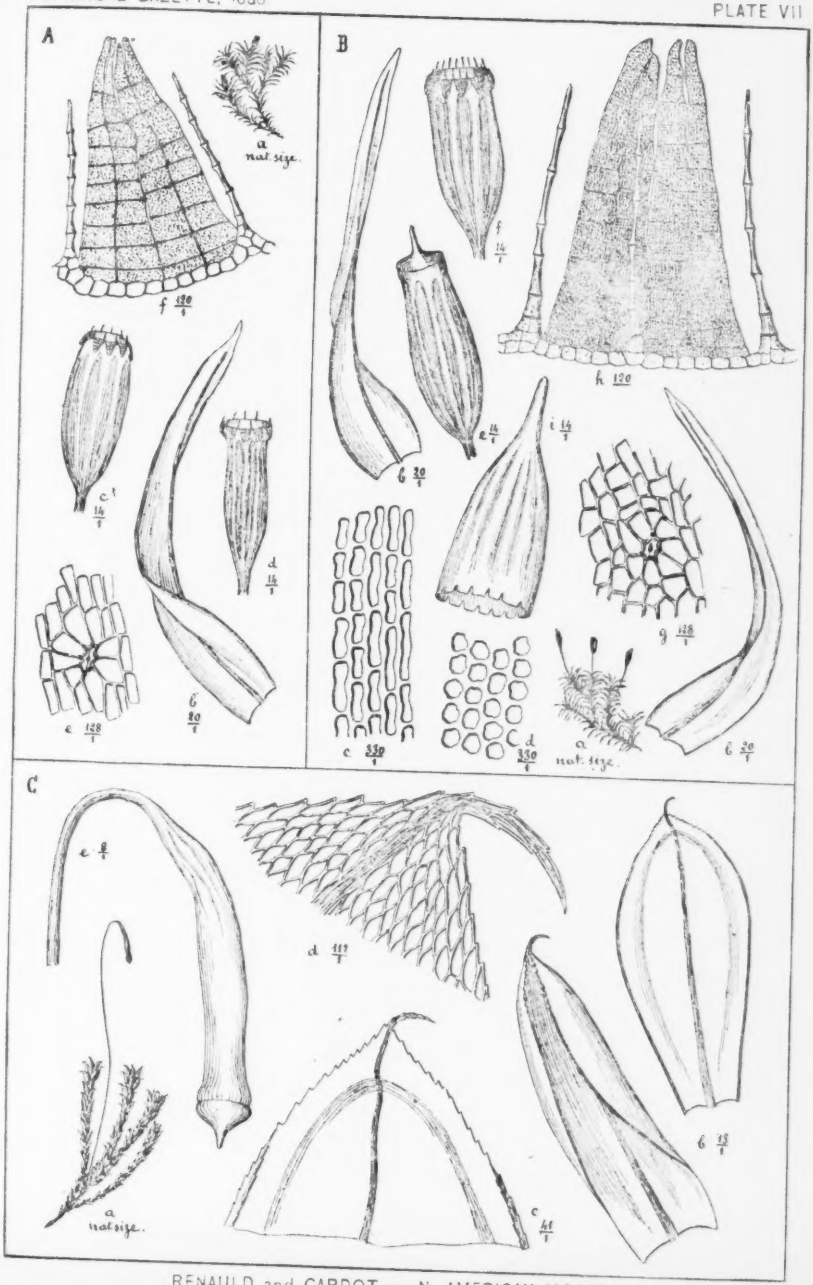
2.
3.
4.
1.



RENAULD and CARDOT on N. AMERICAN MOSSES.



RENAULD and CARDOT on N. AMERICAN MOSSES.



RENAULD and CARDOT on N. AMERICAN MOSSES.